

**Claims**

1. A composition for well cementing comprising a pumpable slurry of cement, water and a material having residual water-absorption properties after the setting of the cement, thereby susceptible to swell in contact with underground water in case of failure of the cement matrix.
2. The composition of claim 1, wherein said material is a super-absorbent polymer.
3. The cement system of claim 1, wherein the super-absorbent polymer is selected from the list consisting of polymethacrylate and polyacrylamide or a non-soluble acrylic polymers.
4. The cement system according to any of claims 2 to 3, wherein the super-absorbent polymer is added to the slurry dry-blended with the cement.
5. The cement system according to any of claims 2 to 4, wherein the super-absorbent polymer is added at a concentration between 0.05% and 3.2% by weight of cement...
6. The cement system according to claims 2 to 5 further comprising a salt.
7. The cement system of claim 6, wherein said salt is sodium chloride or calcium chloride.
8. The cement slurry according to claims 2 to 7, wherein the super-absorbent polymer is added under the form of particles ranging from 10 to 1500 $\mu$ .
9. The cement system according to any of the preceding claims, whereby the material is provided in a capsule that releases the material in response to exposure of the cement to at least one downhole parameter.
10. The cement system according to any of claims 1 to 9, whereby the material is provided in a capsule that releases the material when the cement matrix cracks.

11. The cement system according to any of the preceding claims further comprising at least one additive selected from the list consisting of dispersing agent, fluid loss control agent, set retarder, set accelerator and anti-foaming agent.